gave signs posteriorly only. Cavities as a rule give more marked signs anteriorly. Thus, of the 58 under consideration, the signs were present anteriorly, or anteriorly and posteriorly in 55 instances, while but 3 gave signs posteriorly alone.

From this analysis it is evident that our results were not as accurate as they might have been, particularly in the estimation of conditions simulating cavity formation.

As far as the recognition of cavities actually present was concerned the results were fairly good, as the majority of those escaping notice were very small and the conditions found postmortem, in a measure, explained the cause of failure.

Basing the value of the various signs on the frequency with which each occurred, the following results were obtained: whispering pectoriloquy, 55 out of 58; tympany, 39 out of 58; cavernous or amphoric breathing, 38 out of 58; gurgling or consonating rales, 33 out of 58. While whispering pectoriloquy was most frequently met with its value is somewhat impaired by its absence in cases of well-marked cavitation, and also by the fact that its presence occasionally leads to a diagnosis of cavity when other pathological conditions, notably consolidation about a bronchus, are the real causes.

In conclusion, it may be said that any one of the above signs is suggestive of a cavity and that the probability of its existence is increased by the combination of any two or more of them.

STATISTICS OF DIET IN SANATORIA FOR CONSUMPTIVES.[1]

By Irving Fisher, Ph.D.,

PROFESSOR OF POLITICAL ECONOMY IN YALE UNIVERSITY; SECRETARY OF THE NEW HAVEN COUNTY (CONNECTICUT) ANTI-TUBERCULOSIS ASSOCIATION.

Hitherto, the chief weapons used in fighting tuberculosis have been fresh air and rest. But in such a desperate combat, every available weapon should be used—regularly graduated exercise, massage, hydrotherapy, mental diversion and suggestion, and last but not least, diet. Diet, however, while doubtless one of the most important agencies for the restoration of the consumptive's health, is also probably the most obscure and difficult of application.

The theories of diet in relation to tuberculosis are numerous and conflicting. Some authorities still cling to whiskey; most advocate meat, but there are a few whose experience has led them to discard meat; some emphasize the importance of cooking meat thoroughly, others maintain that it should be taken raw; eggs are recommended by some and rejected by others; and the same conflict of opinion exists even as to milk, potatoes, other vegetables, fruits, nuts, etc. There are those who have a theory that tuberculosis is first of all a disease of general malnutrition, and can be cured by a general diet aimed to restore the powers of digestion and assimulation; others maintain that for the cure of tuberculosis a *specific* diet is needed, for instance, blood serum or mineral salts. Until recently forced-feeding was the rule. The wisdom of this, however, is now also called in question. It is usually assumed that the consumptive needs a large amount of proteid, but there are experiments which have tended to show that excessive proteid is injurious, not only to the healthy man, but even more so to the tuberculous invalid. Again there is a belief that consumption is largely produced by the omission of fat from the diet, and is to be cured by inducing the patient to consume large quantities of emulsion. Others maintain that the aversion to fat which is alleged to precede consumption, if it exists, is due to a deficiency of gastric juice, and that the consumptive instinctively avoids fat because it tends to restrain the secretion of such small amount of juice as the stomach is able to produce.

---

[1] Read at the meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 17 and 18, 1906.

It is evident, therefore, that the subject of diet in tuberculosis requires much study. I disclaim any special knowledge, and the present paper aims merely to present statistics of existing methods collected for comparative purposes.

Letters of inquiry were sent to 95 of the leading sanatoria of the world, of which 63 were in the United States, 2 in Canada, 13 in Germany, 11 in Great Britain and Ireland, and the remainder in France, Austria, Norway, Switzerland, and Russia.

Very few supplied any measured data. In most cases the statement of the food consumed was given only in a general way. Tables I and II give the data received which are not in measurable form, so far as they seem in the least noteworthy. Some remarks have been omitted in the belief that those from whom they came might object to seeing them in print. Two sanatoria (one American and one German) replied that they could not regulate their patients' diet, because their patients were able to pay well and expected to get what they wanted to eat! Some sanatoria which replied are omitted owing to the fact that their replies contained no data.

On the other hand, a considerable number of sanatoria had made an exact record of the diet used, or kindly took the trouble to do so expressly in order to answer my questions. On the basis of these measured data Tables III and IV have been calculated, in which are incorporated also such measured data as I have chanced upon in various publications.

The first comment which naturally occurs to one who reads these four tables is that in most cases the foods employed are simply the foods in common use in the country or place where the sanatorium

TABLE I.—UNMEASURED DIET (AMERICAN). (ARRANGED IN ALPHABETICAL ORDER OF LOCATION).

Institution.	Location.	Physician in charge.	Food.	Meals.[1]	Remarks
Maryland St. Hospital.	Baltimore	Louis Hamman.	Ordinary.	3 (+2)	"As liberal supply as they can manage."
Montefiore Home.	Bedford Sta. N. Y.	L. Rosenberg.			Moderate force-feeding.
Boulder Sanit.	Boulder, Col.	W. H. Riley, (formerly). (No longer takes tbc. cases.)	Meat seldom.		High proteid. Moderate calories. Meat only when other proteid not relished. Usually those who tired of other proteid also tired of meat.
Kings Co. Hospital.	Brooklyn, N. Y.	J. F. Fitzgerald.	Ordinary.		Some force-feeding.
Brooklyn Home for Cons.	Brooklyn, N. Y.	E. Reynolds.			All stages. Uses oils combined with corn syrup, gets more wgt. gaining than when uncombined.
Nordrach Ranch	Colorado Springs.	Jno. E. White.	Milk the staple.		Force-feeding. One man took 29 glasses of milk a day.
Pembroke San.	Concord, N. H.	H. T. Fontaine.			Force-feeding.
Nat. Jewish Hospital.	Denver, Col.	M. Collins.	Ordinary (much fat).		Reaction against force-feeding, causes stomach trouble. Individualizes.
Y. M. C. A. Health Farm.	Denver, Col.	Jno. Wethered.			Opposed to force-feeding.
Hotel Dieu (Sisters' Hospital).	El Paso, Texas.	Outside physicians	Ordinary.		
U. S. Gen. Hospital.	Ft. Bayard, N. M.	Geo. Bushnell.	Ordinary.		Amount consumed limited only by capacity and desire.
Sanit. Gabriels	Gabriels, N. Y.	W. H. Clancy.	Ordinary.	3 (+3)	Force-feeding.
Muskoka Cottage San.	Gravenhurst, Ont.	J. H. Elliott.			"We constantly see cases of tuberculosis in which there is a steady gain in weight from week to week though a small amount of food is taken."
Muskoka Free Hospital.	Gravenhurst, Ont.	F. D. Parfit.	Ordinary.	3 (+2)	
State Hosp.	Howard, R. I.	F. B. Jewett.	Ordinary.		Moderate force-feeding.
Stony Wold San.	Lake Kushaqua, N. Y.	H. S. Goodell.			Mixed diet, preponderance of proteid and fat.
Loomis Sanit.	Liberty, N. Y.	Dr. King.	Ordinary.	3 (+3)	Considerable fruit. Few nuts.
Pottenger San.	Monrovia, Cal.	F. M. Pottenger.			Reaction against force-feeding.
South Mt. Camp San.	Mont Alto, Pa.	A. M. Rothrock.			No restraint on amount of food. Believes, however, in limiting proteids.
Seton Hospital.	N. Y. City.	E. C. Garlock.	Uses beer.	3.	
St. Joseph's Hospital.	N. Y. City.	C. M. Cauldwell.		3 (+2 or 3)	Includes cod-liver oil and maltzyme.
Grand View Inst. for Cons.	Oil City, Pa.	H. E. Kirshner.		3	Average diet consists of 6 or 8 raw eggs, 2 qts. milk and full meal at dinner time. Patients often gain better upon three meals than when two lunches are added. Also some gain better taking 6 eggs than when they have been given as high as 16 in a day.
Ottawa Tent Colony.	Ottawa Ill.	J. W. Pettit.	Ordinary; + nuts.	3 (+3)	Applies domestic science and balanced bills of fare.
R. I. State San.	Pascoag, R. I.	H. L. Barnes.	Ordinary.	3	
Phila. Gen. Hospital.	Philadelphia.	Wm. B. Stanton.			Much liquid, 3 qts. milk, 6 raw eggs and 1 full meat meal daily.
N. Y. State Hospital.	Ray Brook.	Burnham.			Force-feeding.
Mass. State San.	Rutland, Mass.	W. J. Marclay.	Ordinary.	3 (+3)	Reaction against force-feeding.
West Mt. San.	Scranton, Pa.	J. M. Wainwright.			Force-feeding.

---

[1] The numbers in parentheses are extra lunches additional to regular meals. These extra unches usually consist of milk and eggs.

TABLE I.—(Continued).

Institution.	Location.	Physician in charge.	Food.	Meals.[1]	Remarks.
Sharon San.	Sharon, Mass.	W. S. Griffin.			Moderate force-feeding.
New Mexico Cottage San.	Silver City, N. M.	E. S. Bullock.		3	Least to gain weight, ideal is 20 lbs. above normal, av. gain 30 lbs. High nitrogen. Reaction against over-feeding, individualizes.
Mt. St. Rose San.	St. Louis, Mo.	Wm. Porter.	Ordinary.		Individualizes.
Washington Asylum	Washington, D. C.	L. F. Zinkhan.		3	Much fat.
Sunnyrest San.	White Haven, Pa.	E. Stockdale.	Ordinary; + fruit and nuts.	1 (+5)	Large gains in wgt. Finds that any one can take milk and eggs granting they are the right quality

TABLE II.—UNMEASURED DIET (FOREIGN). (ARRANGED IN ALPHABETICAL ORDER OF LOCATION.)

Institution.	Location	Physician in charge.	Food.	Meals.[1]	Remarks.
Tonsaasen	Christiania, Norway.	Andvord.			Against force-feeding. Patients should "reduce outgo instead of increase income," *i. e.* rest instead of overfeed.
Turban's San.	Davos-Platz, Switzerland.	S. Turban.			Force-feeding.
San. Brehmer	Goerbersdorf, Germany.	Von Hahn.		5	
Institut. für Pharmokol und Physiol. Chem.	Rostock, Germany.	R. Kobert.			Force-feeding. Proteids and fats.
Römpler's San.	Goerbersdorf, Germany.	Th. Römpler.			No restriction in diet.
San. Grand Hotel.	Leysin, Switzerland.	Echaquet.			Seen many digestions ruined by over-feeding, yet patients without appetite should be urged.
Mt. Vernon Hospital.	London.	T. N. Kelynack.			Individualizes.
Nordrach Colonie	Nordrach, Germany.	Otto Walther.			Minimum diet for weight gaiuing. Individualizes. Some hardly any meat, others much. "Av. 1–5 meat and albuminous, 1–5 fat, 3–5 farinaceous, ordinary diet about 15% proteid, 35% fat."
Kremser San.	Sulzhayn	Kremser.	Ordinary.	3 (+2)	"I absolutely disagree with the general super-alimentation practised in many sanatoriums—my experience proves that an overfeeding has not the least favorable effect on weight gaining, but that the chief point is, to keep the proper balance in the composition of the diet, *i. e.* proteids, fat and carbohydrates, like 1:3 resp. 1:4 1–2."
	St. Petersburg, Russia.	Simon de Unterberger.			Much meat. Opposed to diet regulation.

---

[1] The numbers in parentheses are extra lunches additional to regular meals. These extra lunches usually consist of milk and eggs.

TABLE III.—MEASURED DIET. (IN ORDER OF QUANTITY OF FOOD USED.)

Institution.	Location.	Physician in charge.	Food and number of meals.	Proteid.	Fat.	Carbohydrate.	Total calories.	Remarks.
Roten Kreuz San.	Grabowsee, Germany.	Werner.		1200	2200	2100	5500	
Maine San.	Hebron, Me.	Estes Nichols.		840	1900	1640	4380[1]	Does not include extra eggs and milk.
			Ordinary.	500	1200	1600	3300[2]	
Post Graduate Annex.	N. Y. City.	Jno. F. Russell. For rest treatment only milk, bread, butter, emulsion, and vegetable juice. In all cases excludes alcohol, tobacco, tea, coffee, chocolate, cocoa, beef-tea, meat extracts, meat juice, and vinegar.		510	2165	1565	4240	Average diet under rest treatment. Uses glycerin, calcium, chloride and cathartics systematically; ambulant cases use more food; in selected cases discards meats.
Rekneas San.	Kristiana, Norway.	Edw. Kaurin.		820	1860	1470	4150	
Royal Nat. Hos. for Cons.	Ventnor, Isle of Wight.		Ordinary.	700	1660	1640	4000	Average diet.
Agnes Memorial San.	Denver, Col.	G. W. Holden.	Ordinary; 3	830	1665	1470	3965	Greater gains of weight on 3 than on 5 meals.
Reception Hos.	Saranac Lake, N. Y.	E. R. Baldwin.	Ordinary; 3 (+2)	650	2000	1250	3900	
Millet San.	East Bridgewater, Mass.	C. S. Millet.	Ordinary. 3	600	1500	1450	3550	Average 4 days one patient.
Gaylord Farm San.	Wallingford, Conn.	D. R. Lyman.	3	530	1480	1540	3550	No force-feeding except in special cases. Most are restrained from over-eating. Average gain in weight of of the 10 discharged cases whose average diet was given was 19 lbs. in from 3 to 6 months, varying from 13 to 22, proteid from 340 to 630, fat from 1100 to 2000, and the calories of the ten varied from 2700 to 4100. Those ten cases were heavier eaters than the average. They had 3 meals and one or two glasses of milk between meals. No extra eggs. 7 were males, 3 females. 5 were at or above their normal weight when discharged (by insurance tables) five below.
Pine Ridge Camp.	Providence, R. I.	W. H. Peters.	Ordinary.	900	1700	900	3500	Fairly early, weight gaining cases.
U. S. Pub. Health & Marine Hos. Ser.	Ft. Stanton, N.M.	P. M. Carrington.		650	750	1900	3300	Based on standard diet of U. S. Health & M. H. Serv. with addition of milk and eggs.
Stadt. San.	Munich.	Filler.		570	1130	1570	3270	If necessary.
			Ordinary.	500	1320	1230	3050	"Journal of the Outdoor Life," January, 1906.

---

[1] Amount administered at first.

[2] Amount administered during convalescence.

TABLE III.—(Continued).

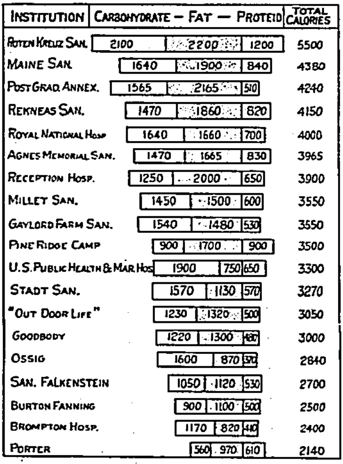
Institution.	Location.	Physician in charge.	Food and number of meals.	Proteid.	Fat.	Carbohydrate	Total calories.	Remarks.
		Goodbody, Bardswell & Chapman.		480	1300	1220	3000	Most suitable diet for tuberculosis, Med. Chir. Trans., vol. lxxxiv, 1902, pp. 119-120.
			Nuts, fruit and grains, exclusively.	370	870	1600	2840	Proposed in "Good Health," 1905, by Dr. Herbert Ossig.
San. Falkenstein.	Falkenstein, Germany.	Besold.		530	1120	1050	2700 3400 2000	Opinions on superalimentation agree with Dettweiler, his predecessor. Chief aim should be not to make patient as fat as possible and "one never can expect a patient to be the more resistant to disease the fatter he is or becomes." Superalimentation only needed to compensate the loss of proteids and fats, especially needed in feverish cases. In later cases much fat given. In other cases individualises the diet by weighing the patient.
Winyah San.	Asheville, N. C.	Von Ruck.	Ordinary.				2500	Digestive complications determined by laboratory examinations. For weight gaining, fats and carbohydrates predominate.
		Burton-Fanning.	Ordinary; 3+(3); few vegetables.	500	1100	900	2500	See his "Open-air Treatment of Tuberculosis."
Brompton Hos. for Cons.	London.	Williams.	Ordinary.	410	820	1170	2400	Average diet.
	NewYork.	W. H. Porter	Excludes potatoes, cereals, fruit, nuts, pastry, most, vegetables, soups.	610	970	560	2140	"American Medicine," Sept. 20, 1902.

is situated. Almost any article of food, however deleterious in the estimation of physiologists, can be found in the lists supplied, such, for instance, as wine, beer, vinegar, pickles, catsup, fried food, pork, sausage, tripe, tea, coffee, gingerbread, pastry, etc. On the other hand, some of the sanatoria have taken particular pains to exclude foods regarded as deleterious, or to make extensive use of foods regarded as specially beneficial, aside from eggs and milk, which are, of course, a very common mainstay. Thus, a few make special use of nuts and fruit; others, cod liver-oil; others, Russell's emulsion, peptol, corn-syrup and oil, malted nuts, maltzyme, vegetable juices, etc. Most institutions probably make a point of excluding alcohol;

others bar out tobacco, tea, coffee, chocolate, cocoa, beef-tea, meat extracts, meat juices and vinegar; a few exclude meat; and one combines with forced-feeding a systematic use of cathartics.

In regard to the question of the quantity of food consumed, out of the 65 institutions tabulated, 28 were distinctly in favor of the system of forced-feeding, and 20 were distinctly reactionaries against it. Among the latter are some of those who have had the widest experience. In the table of measured data it will be seen that the dietaries range all the way from 2100 calories to 5500—a range of 160 per cent.

TABLE IV.—COMPARISON OF THE CALORIC VALUE OF THE DIET AT DIFFERENT SANATORIA.



Naturally, not all of these standards can be correct, and if we are to believe that there is any virtue in "physiological economy" we must conclude that those sanatoria which use the lowest standards consistent with weight-gaining must be more nearly on the right track. It may well be, however, that the minimum standard used in one sanatorium could not be employed in another without a corresponding change in the character of the foods used, or in the proportions of proteids, fats, and carbohydrates. One physician who has done much intelligent experimenting found that less food was necessary when bread and butter were added to a diet which previously had consisted of milk and fats exclusively. Two report that patients often gain better on three meals than on five or six, and one states that six eggs a day often produce better gains than sixteen. In one case, the patients are usually advised against eating as much as they would if left to their own devices. The weight-gains in this place average nineteen pounds in from three to six months. In this same institution it has been found that a prime factor in weight-gaining is the palatability of the food.

On the basis of the tables, we may feel considerable confidence that, given proper foods and proper proportions of food elements, the average tuberculous patient can be successfully nourished on 3000 calories or less per day, in other words, on *no more than is usually consumed by the ordinary sedentary man.* It is also extremely probable that seldom can less than 2000 calories be employed without loss of weight. There will doubtless be found considerable variation between 2000 and 3000, due to differences in the weight of the patients, differences in activity, powers of assimilation, and the extent of the disease.

Hitherto there has evidently been too much ambition to produce large gains in weight. This ambition is doubtless responsible in large measure for the extremes to which overfeeding has been practised. Weight-gaining, purchased at the cost of strain on the physiological machinery, is of very doubtful value, and it may be especially questioned whether the overfeeding practised *during convalescence* or after the patient is apparently cured, cannot be entirely dispensed with. The experiments, in England, of Doctors Goodbody, Bardswell, and Chapman show that overfeeding healthy individuals produces weight-gaining, but injures their health and fitness for work. The comment of an observing physician to me on patients discharged from a large and celebrated sanatorium was that they were fat, but weak.

It has hitherto been the fashion to advise patients, when leaving a sanatorium, to maintain their weight above the normal, the belief apparently being that the surplus would stand them in good stead in case of a relapse. But it may well be that relapses themselves are made more probable by the attempt to maintain and carry surplus weight, and the consequent daily tax on the powers of digestion and assimilation to maintain this unnatural state. Assuming that the observations of Goodbody, Bardswell, and Chapman apply to the discharged patient, we may well ask whether the attempt to maintain their weights above normal is not a chief cause of the tendency of the disease to recur. The discharged patient, ambitious to resume his former work, must be considerably handicapped by attempting at the same time to remain fleshy, especially if, as is usually the case, his digestive powers are naturally weak. His working power must needs be impaired, and the danger of working beyond his strength is naturally increased. One patient, for two years after his first attempt to resume work following recovery from tuberculosis, was decidedly below par in his working efficiency. It was only after practising the "physiological economy," demonstrated and advocated by Professor Chittenden, and losing twenty pounds of useless weight that he was able to reach or surpass his former working power.

This physiological economy does not, however, consist entirely, or even principally, in the reduction of the total food value. Professor Chittenden has shown that the dietetic sin of the ordinary healthy man consists principally in too high a consumption of proteid, and the question arises whether the same may not be true in the treatment of tuberculous invalids. The evils from using excessive proteid, in the case of healthy men, have been very thoroughly proved by the work of Professor Chittenden. I have also confirmed them by a collection of statistics gathered from physicians, physiologists, and experimenters with diet to the number of many hundreds of cases. Among these are included a squad of nine students at Yale who have been experimenting on this line. Their experience shows that physical and mental endurance are immensely increased by a reduction in the amount of proteid ordinarily consumed.

In the case of the tuberculous invalid, the proteid required is evidently greater than for the healthy man. Tuberculosis, being a wasting disease, should naturally require much material for repairs. But the work of Chittenden and Folin has shown that the proteid requirement is so much within the ordinary proteid consumption, that even were it found that the tuberculous invalid *requires* double or treble the amount *required* for a healthy man, he would still be far from requiring the amounts which are often fed to him. The tables which have been presented show a wider range in the amount of proteid used than even in the total calories. The proteid ranges from 370 to 1200 calories. The lowest of these is beyond the Chittenden requirement for the healthy man, which for a man weighing 140 pounds is about 210.

Hitherto there have been very few experiments to determine what the effect of an increase or decrease of proteid may be on the tuberculous patient. In one case a physician who had been feeding a patient 3000 calories a day, of which about 350 were proteid, found that the patient's symptoms improved under this diet, though his weight did not increase. Desiring to effect an increase of weight he attempted to increase the proteid, but this change instead of producing weight-gaining, seemed to raise the patient's temperature. Dr. J. H. Kellogg, of the Battle Creek Sanitarium, believes in a minimum proteid, about two ounces, or three in some cases (240 to 360 calories), because (1) consumptives often lack gastric juice and pepsin, (2) proteid in excess is quickly oxidized and adds to fever if already present, (3) proteid in excess leaves waste products, and (4) proteid in the form of meat has toxins already formed.

If the principle of physiological economy is sound, the minimum proteid which will produce the necessary repairs is the best amount to be administered. Anything below this minimum will of course lead to disaster. Physicians have rightly tried to be on the safe side, but have usually left a much larger margin of safety than is necessary.

Burton-Fanning says that the secret of feeding the consumptive is summed up in the word "accuracy." To obtain this accuracy—to achieve physiological economy and at the same time full nutrition—a careful and measured study of diet is needed. Fortunately, today such measurement is possible, and far easier than a few years ago. I have attempted to show[1] a simple method by which a patient's diet may be recorded and regulated without any personal annoyance or anxiety on his part.

An examination of the preceding tables will show that not only proteids but also fats and carbohydrates vary widely. In one case the fat alone amounts to 2200 calories, or as much as the total food in some institutions. In another case it is as low as 750.

When the questions of the quantity of food and the proteids, fats, and carbohydrates are settled there will remain the question of what kinds of foods are best. We need facts as to the effects on tuberculosis of alcohol, tobacco, tea, coffee, pepper, vinegar, spices, oils, emulsions, vegetable juices, and even meat, eggs, and milk. Not one of these should be accepted as the best or as a universal food in tuberculosis, except provisionally.

The question of meat is closely bound up with the question of proteid, for the quantity of proteid will usually vary with the quantity of meat. But meat should also be considered apart from the question of proteid. It would appear that the sole virtue of meat not possessed by other ordinary proteid food, lies in the fact that it is highly peptogenic. Pawlow found that meat was more highly peptogenic than any other food with which he experimented. Chemical analysis has shown that meat is deficient in mineral salts, that eggs, milk, and vegetables contain more iron, as well as all other minerals, than does meat.

The suggestion that meat possesses a serum virtue, specific in the treatment of tuberculosis, is apparently as much without experimental verification as, a few years ago, the suggestion that urea is a specific in tuberculosis. In respect to digestibility, certain other forms of proteid, such as gluten, are superior to meat. The peptogenic virtue which meat possesses is evidently very greatly in its favor, especially in the treatment of tuberculosis. But the opponents of meat point out that the peptogenic effect is secured at the expense of introducing into the system poisonous waste products. It would seem to follow from this that if a sufficient stimulus to the secretion of gastric juice can be secured without the use of meat there will result physiological economy.

---

[1] Amer. Jour. Physiology, April, 1906.

If meat is to be used, a subsidiary question arises whether it should be cooked or raw. Richet and others have advocated raw meat, and have seemed to base their conclusions on experimental evidence, but the check experiments of Dr. Brown at Saranac Lake have failed to confirm Richet's conclusions.

Finally, it is doubtless of the highest importance to individualize the diet. This has been emphasized in many of the replies, though oddly enough, some who have most emphasized the necessity of individualizing the diet have urged it as an argument against a measured dietary. It is, of course, true that if an accurate adjustment of diet to individual needs is to be sought, even greater importance attaches to the measurement of diet than would be the case if a single diet would suffice for all patients. In order suitably to adjust the diet to particular idiosyncrasies of the individual, the sanatoria might do well to make a systematic use of gastric analysis, in order particularly to determine the amount of secretion of hydrochloric acid and pepsin. The results would give the physician a clue as to whether the patient needs a large amount of fat to repress the acid secretion, or will do better by substituting carbohydrates because of a deficiency, and also to what extent it is necessary to stimulate the formation of pepsin by means of peptogenic foods, such as meat and sweets.

But after all the measurements and adjustments have been made for the patient, it is doubtless true that much must be left to his own taste. The greatest service the physician can perform for his patient in the matter of diet is to normalize the food instinct so that the patient can be trusted to select his own food correctly. To this end it is suggested that experiments in careful mastication be made on patients in order that the taste may be given a longer period in which to judge as to its likes and dislikes. It was on this basis that I experimented on the squad of nine healthy Yale students. In their case the result in ten weeks was an instinctive lessening of proteid, especially in meat form, and an increase in endurance, as shown by gymnasium tests, amounting to over 50 per cent.

We conclude that there is as yet very little known with certainty as to the most efficient diet in the treatment of tuberculosis, or the extent to which the diet must be individualized. In order to determine either the standard or individual diet, much study and accurate observation are needed.

Hitherto, with a few notable exceptions, sanatoria have merely imitated the home table. But it is unscientific to follow current custom in food, and may be quite as disastrous to the patient as to follow current custom in ventilation. It is equally unscientific to follow dogmatic opinion of authorities, however eminent. No science ever made progress which depended on opinions. The only tribunal in true science is the tribunal of facts, carefully arranged and sifted.

It will undoubtedly happen that in the next few years sanatoria and laboratories will provide the necessary observations. These observations should include observations on the consumptive's diet before entering sanatoria. Such data are now being collected by one institution, and will serve to determine the question whether fat is rejected by consumptives as a rule. When the needed data have been obtained and interpreted, the question of diet will have been raised out of the realm of opinion to the plane of verified fact.

THE RELATIVE VALUE OF THE HOME TREATMENT OF TUBERCULOSIS.[1]

By Lawrence F. Flick, M.D.,
DIRECTOR OF THE HENRY PHIPPS INSTITUTE FOR THE STUDY, TREATMENT, AND PREVENTION OF TUBERCULOSIS, PHILADELPHIA.

Treatment of tuberculosis is of very recent birth. To do something to make a tuberculous subject get well, actually to contribute something toward his recovery by any method other than change of climate, is a new concept, so new that very few physicians as yet grasp it. Such a treatment exists at present and is a valuable addendum to the armamentarium of the physician.

In the not very distant past there was but one course open to a tuberculous subject who wanted to save his life, namely, to change climate. This was called the climatic treatment, and whilst it did not save life very often, it did so sometimes when applied early in the disease. It was the only treatment in which the physicians and the people had confidence, and when it could not be applied the unfortunate victim was consigned to death on the slow, easy road of close confinement in a tightly shut room, with opiates, cod-liver oil, squills, tartar emetic, and patent medicines of every possible description. Sometimes the poor fellow got well in spite of this, and then the conclusion was reached that he did not have consumption.

Climatic treatment of tuberculosis in the sense here given has existed since the days of Hippocrates, and during all this time held out hope, but did not remove the stigma of incurability from the disease. The world believed that climate might cure tuberculosis, but unanimously gave the verdict that the disease was incurable. The idea of the curability came with the new treatment of the disease.

---

[1] Read at the meeting of the National Association for the Study and Prevention of Tuberculosis, Washington, D. C., May 17 and 18, 1906.